

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A CMOS operational amplifier comprising:
an amplifying unit for differentially amplifying signals inputted to an inverting input terminal and non-inverting input terminal to reduce an input offset voltage and outputting the amplified signal to an output terminal; and
a slew enhancing unit for increasing a slew rate of the amplified signal outputted to the output terminal of the amplifying unit on the basis of the input voltage value of the inverting input terminal and the input voltage value of the non-inverting input terminal,
wherein the amplifying unit comprises:
a first differential amplifier including the inverting input terminal and the non-inverting input terminal of the amplifying unit and for differentially amplifying a signal inputted to the inverting input terminal and the non-inverting input terminal;
a symmetrical amplifier for generating a signal symmetrical to the signal outputted from a non-inverting output terminal of the first differential amplifier and differentially amplifying the generated signal and the signal outputted from the non-inverting output terminal of the first differential amplifier; and
an amplified signal output unit for differentially amplifying signals inputted from an inverting output terminal and a non-inverting output terminal of the symmetrical amplifier and outputting the amplified signals to the output terminal of the amplifying unit.

2. (Original) The amplifier of claim 1, wherein the amplifying unit and the slew enhancing unit are implemented by a plurality of CMOS (Complementary Metal Oxide Semiconductor).

3. (Canceled).

4. (Currently Amended) The amplifier of claim 3 1, wherein the amplifying unit further comprises:

a compensator for guaranteeing a frequency stability through a frequency compensation of the amplifier.

5. (Original) The amplifier of claim 4, wherein the compensator includes a resistor and a condenser connected in series to the resistor.

6. (Currently Amended) The amplifier of claim 3 1, wherein the symmetrical amplifier comprises:

an input symmetry unit for generating a the signal symmetrical to the signal outputted from the non-inverting output terminal of the first differential amplifier and outputting the generated signal; and

a second differential amplifier for differentially amplifying the signal outputted from the non-inverting output terminal of the first differential amplifier and the signal generated by the input symmetry unit.

7. (Original) The amplifier of claim 6, wherein the input symmetry unit amplifies a common voltage of signals inputted to the inverting input terminal and the non-inverting input terminal and generates the symmetrical signal.

8. (Currently Amended) The amplifier of claim 3 1, wherein the slew enhancing unit comprises:

a discharge controller for generating a signal for discharging a current charged in a capacitive load connected to the output terminal on the basis of the signal outputted from the non-inverting output terminal of the first differential amplifier and the signal generated by the symmetry amplifier;

a charge controller for generating a signal for charging a current to the capacitive load connected to the output terminal on the basis of the signal outputted from the inverting output terminal of the first differential amplifier; and

a discharge/charge driving unit for discharging a current charged in the capacitive load connected to the output terminal of the amplifying unit or charging a current to the capacitive load on the basis of the signals generated from the discharge controller and the charge controller.

9. (Original) The amplifier of claim 8, wherein when an input voltage value of the inverting input terminal is greater than an input voltage value of the non-inverting input terminal and a voltage difference between the inverting input terminal and the non-inverting input terminal is greater than a prescribed voltage, the discharge controller discharges a current charged in the capacitive load.

10. (Original) The amplifier of claim 9, wherein when the input voltage value of the inverting input terminal is greater than the input voltage value of the non-inverting input terminal and the voltage difference between the inverting input terminal and the non-inverting input terminal is smaller than a prescribed voltage, the discharge controller stops discharging of the current charged in the capacitive load.

11. (Original) The amplifier of claim 8, wherein when the input voltage value of the non-inverting input terminal is greater than the input voltage value of the inverting input terminal and the voltage difference between the inverting input terminal and the non-inverting input terminal is greater than a prescribed voltage, the charge controller charges a current into the capacitive load.

12. (Original) The amplifier of claim 11, wherein when the input voltage value of the non-inverting input terminal is greater than the input voltage value of the inverting input terminal and the voltage difference between the inverting input terminal and the non-inverting input terminal is smaller than a prescribed voltage, the charge controller stops charging of the current into the capacitive load.

13. (Original) The amplifier of claim 11, wherein the capacitive load is each pixel of an LCD (Liquid Crystal Display) connected to the output terminal of the amplifying unit.

14. (New) An operational amplifier comprising:

a first differential amplifier for differentially amplifying a signal inputted to an inverting input terminal and a non-inverting input terminal of the first differential amplifier;

a symmetrical amplifier including an input symmetry unit for generating a signal symmetrical to a signal outputted from a non-inverting output terminal of the first differential amplifier and outputting the generated signal, and including a second differential amplifier for differentially amplifying the signal outputted from the non-inverting output terminal of the first differential amplifier and the signal generated by the input symmetry unit; and

an amplified signal output unit for differentially amplifying signals inputted from an inverting output terminal and a non-inverting output terminal of the symmetrical amplifier and outputting the amplified signals to an output terminal of the amplified signal output unit.

15. (New) The operational amplifier of claim 14, further comprising:

a slew enhancing unit for increasing a slew rate of the amplified signal outputted to the output terminal of the amplified signal output unit based on the input voltage values of the inverting and non-inverting input terminals of the first differential amplifier.

16. (New) The operational amplifier of claim 15, wherein the first differential amplifier, the symmetrical amplifier and the slew enhancing unit include a plurality of CMOS (Complementary Metal Oxide Semiconductor).

17. (New) The operational amplifier of claim 14, further comprising:
a compensator for providing a frequency stability through a frequency compensation of the operational amplifier.

18. (New) The operational amplifier of claim 17, wherein the compensator includes a resistor and a condenser connected in series to the resistor.

19. (New) The operational amplifier of claim 14, wherein the input symmetry unit amplifies a common voltage of signals inputted to the inverting and non-inverting input terminals of the first differential amplifier and generates the symmetrical signal.

20. (New) The operational amplifier of claim 14, wherein the slew enhancing unit comprises:

a discharge controller for generating a signal for discharging a current charged in a capacitive load connected to the output terminal of the amplified signal output unit based on the signal outputted from the non-inverting output terminal of the first differential amplifier and the signal generated by the symmetrical amplifier;

a charge controller for generating a signal for charging a current to the capacitive load connected to the output terminal of the amplified signal output unit

based on the signal outputted from the inverting output terminal of the first differential amplifier; and

a discharge/charge driving unit for discharging a current charged in the capacitive load connected to the output terminal of the amplified signal output unit or charging a current to the capacitive load based on the signals generated from the discharge controller and the charge controller.

21. (New) The operational amplifier of claim 20, wherein when an input voltage value of the inverting input terminal is greater than an input voltage value of the non-inverting input terminal and a voltage difference between the inverting and the non-inverting input terminals is greater than a prescribed voltage, the discharge controller discharges a current charged in the capacitive load.

22. (New) The operational amplifier of claim 21, wherein when the input voltage value of the inverting input terminal is greater than the input voltage value of the non-inverting input terminal and the voltage difference between the inverting and non-inverting input terminals is smaller than a prescribed voltage, the discharge controller stops discharging of the current charged in the capacitive load.

23. (New) The operational amplifier of claim 20, wherein when the input voltage value of the non-inverting input terminal is greater than the input voltage value of the inverting input terminal and the voltage difference between the inverting and non-inverting input terminals is greater than a prescribed voltage, the charge controller charges a current into the capacitive load.

24. (New) The operational amplifier of claim 23, wherein when the input voltage value of the non-inverting input terminal is greater than the input voltage value

of the inverting input terminal and the voltage difference between the inverting and non-inverting input terminals is smaller than a prescribed voltage, the charge controller stops charging of the current into the capacitive load.

25. (New) The operational amplifier of claim 24, wherein the capacitive load corresponds to a pixel of an LCD (Liquid Crystal Display) connected to the output terminal of the amplifier.